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Parvapila lyncispinnae new genus and new species (Coleoptera, Melandryidae) from South Africa

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Abstract

The first Orchesiini of South Africa, *Parvapila lyncispinnae* **gen. nov.** and **sp. nov.**, is described. Specimens were collected at the foot of the Langeberg Range and of the Kogelberg, mountains of Western Cape. Individuals were collected by sifting soil litter in Afromontane forests, an endemic vegetation community of Afrotropical mountainous areas.

Key Words

False darkling beetles, Orchesiini, taxonomy, Afrotropical realm, Afromontane region

Introduction

Orchesiini are characterized by their saltatory posterior legs bearing metatarsal spurs longer than the metatibiae and having trilobate genitalia (Nikitsky and Pollock 2011). They are mostly associated with fungi (Hammond and Lawrence 1989) and therefore often occur in moist habitats. In Africa, Orchesiini are represented by nine species in three genera, namely *Eucinetomorphus* Perris, 1875, *Microscapha* LeConte, 1866 and *Orchesia* Latreille, 1807. Three species are recorded from the Afrotropical region (Pic 1942, 1946; Nikitsky and Below 1982), all belonging to the genus *Microscapha* (see comment in Nikitsky and Pollock 2011), while six species occur in North Africa (Nikitsky 2020).

Unidentified specimens of Melandryidae originating from nature reserves situated at the foot of the Langeberg Range and of the Kogelberg, Western Cape, South Africa, were discovered to be an undescribed species of Orchesiini. As it cannot be accommodated in any Orchesiini genera, a new genus is also here established.

Material and methods

Fifty-two specimens were examined. They are housed in the museums listed below.

MHNG Muséum d'histoire naturelle, Geneva, Switzerland
OKZC Ondřej Konvička collection, Zlín, Czech Republic
PBPC Petr Bulirsch collection, Praha, Czech Republic
TMSA Ditsong (= Transvaal) Museum, Pretoria, South Africa

The images were taken with a Leica DFC425 camera in conjunction with a Leica M205–C compound microscope, stacked with Zerene Stacker (version 1.04) and processed with GIMP (version 2.10.30.).

Results

Parvapila gen. nov.

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Type species. *Parvapila lyncispinnae* sp. nov., by present designation and monotypy.

Diagnosis. *Parvapila* has a distinct scutellar shield unlike most of the Orchesiini: *Eucinetomorphus*, *Lederia* Reitter, 1880, *Lederina* Nikitsky & Belov, 1982, *Lyperocharis* Broun, 1914. It can be distinguished from the three Orchesiini genera with visible scutellar shield, *Orchesia*, *Hylobia* Broun, 1880, and *Microscapha* by the following combination of characters: scutellar shield small

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with rounded posterior margin (Fig. 1), suture dividing metanepisterna and metaventrite evanescent posteriad (Fig. 2), and metacoxae directed antero-laterally.

Etymology. The name of this genus refers to its small ("parva" lat.) and convex shape ("pila" lat.: ball).

Description. Body oval, small, ca. 1.5–2.5 mm long. Body convex in lateral view; sides regularly curved in dorsal view. Pubescence on head directed anteriad, on dorsal surface of pronotum, elytra and abdomen directed posteriad.

Head embedded in pronotum and directed downward, hardly visible in dorsal view; delimited posteriorly by carina. Neck surface with strong microreticulation. Distance between dorsal margin of eyes two times eyes width. Antennae long, as long as ca. half of body length, antennomeres progressively widening apicad, without distinct antennal club; insertion point of antennae hidden by lateral margins of frons. Maxillary palpi with strongly transverse articles II and III, apical article cultriform.

Pronotum transverse, regularly convex in lateral view, without impressions; lateral margins with lateral bead in posterior half, anterior and posterior margins not edged; anterior angles broadly rounded, posterior angles orthogonal with rounded tip, pointing posteriad. Scutellum visible, with rounded posterior margin. Elytra elongate; humeral stria marked, forming small gutter with completely edged lateral border. Epipleura well marked on most of elytral length, evenly narrowed posteriad. Elytra fused. Hind wings not developed. Prosternal process triangular, wide. Mesoventral process thin and elongate, triangular. Metaventrite separated from metanepisterna by incomplete suture, evanescent posteriad. Metanepisterna ca. 3 times longer than wide. Metacoxae directed antero-laterally and narrowed.

Legs robust, with wide, short tibiae. Metatarsal spurs and metatarsomeres wide.

Male: Metaventrite with a medial depression.

Parvapila lyncispinnae sp. nov.

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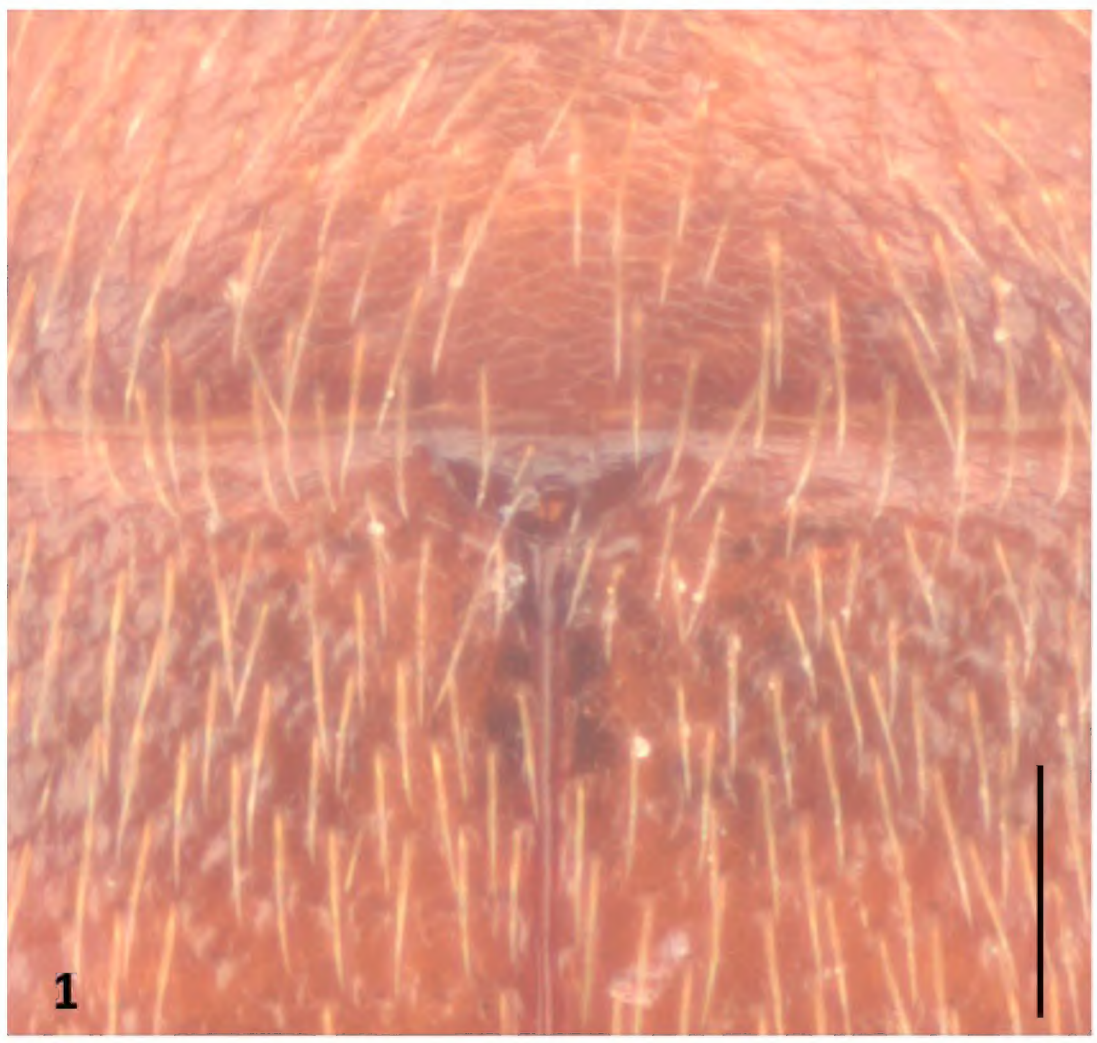
Figs 1–9

Type material. ***Holotype*** (housed in MHNG): MHNG-ENTO-0119356; 1♂; RSA, Western Cape, Grootvadersbosch N.R., 33°59.39'S, 20°48.32'E, 25–26.I.2004; 350 m, sifting, lgt. P. Hlaváč.

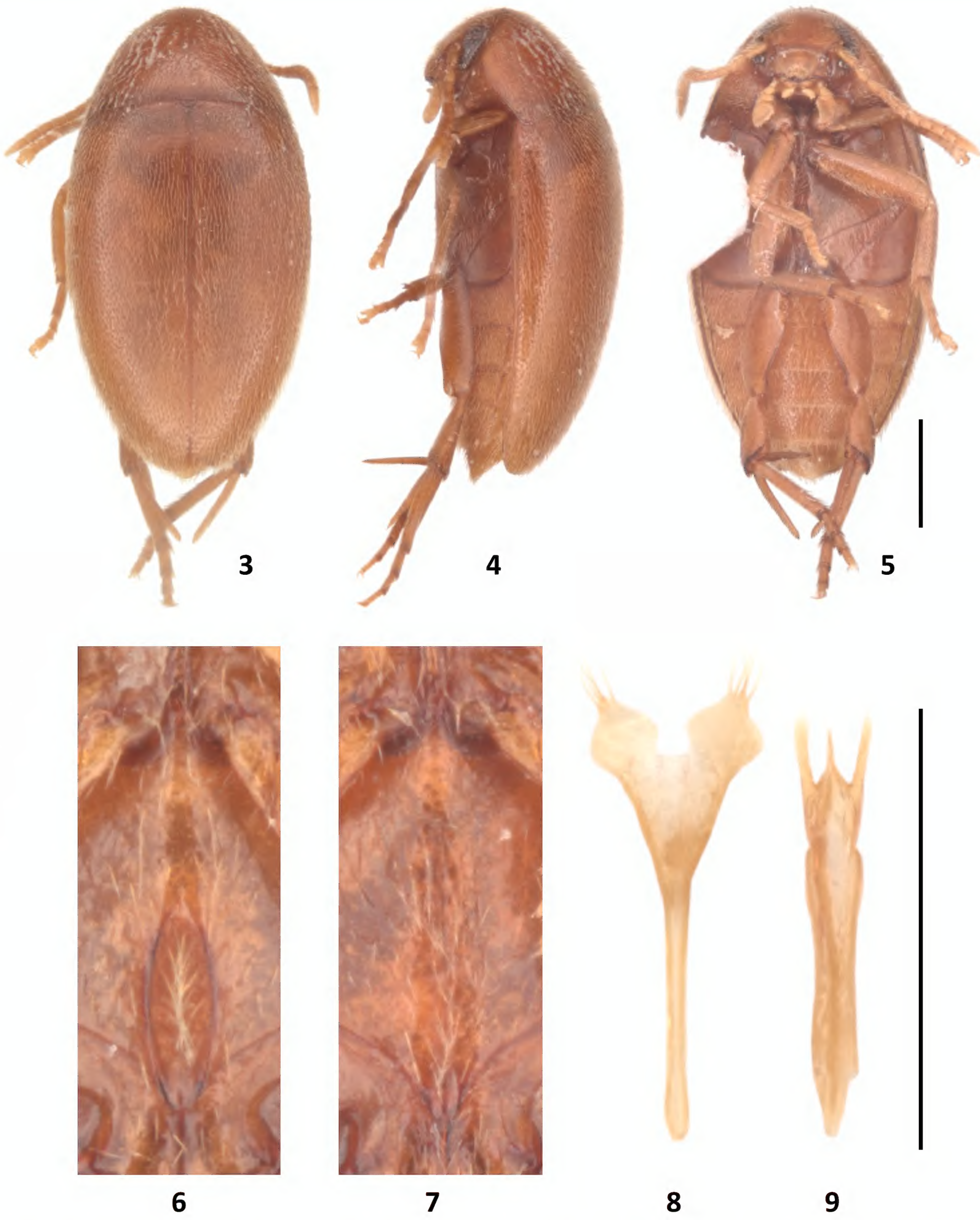
Paratypes (3): MHNG; MHNG-ENTO-0119357 - MHNG-ENTO-0119359; 1♂, 2♀; same data as holotype. - 1♂; OKZC; South Africa, Western Cape, Kogelberg NR, Platbos for., 34°20.1'S, 18°56.0'E, 14.i.2020, P. Bulirsch lgt. - 18♂ and ♀; MHNG, TMSA, PBPC, OKZC; South Africa, Western Cape, Marloth NR, Duiwelsbos for., 33°59.6'S, 20°27.6'E, 25.x.2019, P. Bulirsch lgt. - 5♂ and ♀; MHNG, OKZC: South Africa, Western Cape, Marloth NR, Koloniesbos for., 33°59.5'S, 20°27.1'E, 26.x.2019, P. Bulirsch lgt. - 14♂ and ♀; MHNG, OKZC: South Africa, Western Cape, Marloth NR, Duiwelsbos indig. forest, 33°59.6'S, 20°27.6'E, 22.x.2013, P. Bulirsch lgt. - 10♂ and ♀; MHNG, OKZC: South Africa, Western Cape, Marloth NR, Wamakersbos, ca. 33°59.5'S, 20°28.6'E, 23.i.2020, P. Bulirsch lgt.

Diagnosis. For now, *Parvapila lyncispinnae* is the only known species of this genus. It can be easily distinguished from other Orchesiini by characters given in the diagnosis of *Parvapila*.

Etymology. The specific epithet refers to the shape of the sternite IX of males, which bears two patches of setae, recalling the tufted ears of the Eurasian lynx.



Figures 1, 2. *Parvapila* gen. nov. **1.** Scutellar shield; **2.** Metanepisternum. Scale bars: 0.1 mm.



Figures 3–9. *Parvapila lyncispinnae* sp. nov. **3–5.** Habitus; **6.** Male metaventrite; **7.** Female metaventrite; **8.** Male sternite IX; **9.** Aedeagus. Scale bars: 0.5 mm.

Description. Length: 1.48–2.51 mm; width: 0.78–1.28 mm; depth: 0.57–0.91.

Body (Figs 3–5) oval, ca. twice longer than wide, widest at middle; sides regularly arcuate in dorsal view; body convex in lateral view, slightly elongated posteriorly. Body yellowish to orange-reddish. Pubescence regular and dense, yellowish.

Head with strong setiferous punctation; surface covered by homogeneous transverse microreticulation. Clypeus with strong and rough punctation; surface lacking microreticulation. Antennae long, reaching posteriorly ca. middle of body; antennomeres progressively widening toward apex, not forming distinct club; length ratios of antennomeres: 22-16-13-8-11-12-10-11-14-13-29; antennomere I

and XI ca. twice longer than wide, antennomeres II, III, V, VI, and VII slightly elongate, antennomeres IV, VIII, and X slightly transverse, antennomere IX as long as wide. Basal maxillary palpomere small, as long as wide; second article transverse; penultimate article transverse, three times wider than long; distal maxillary palpomere 1.2 times longer than wide, widest at base, with inner margin slightly concave, outer margin widely rounded.

Pronotum ca. 0.4 times as long as wide, widest at base; surface covered by fine punctation, two times denser anteriorly than at base; elytral surface covered by microreticulation formed of transverse to polyhedral meshes. Elytra 1.5 times longer than wide; homogeneously covered with small granules except for elytral base, and with dense confluent rough punctation; lacking microreticulation, shining; pubescence long and dense directed posteriad. Scutellar shield small, 0.07 mm wide, ca. twice longer than wide, with rounded posterior margin, surface smooth and shining, bearing a few hairs. Metaventrite shining, homogeneously covered by shallow microreticulation and fine punctation and pubescence. Length of both metatarsal spurs subequal, almost as long as metatarsomere I; first metatarsomere seven times longer than wide; length ratio of metatarsomeres: 38-12-9-11.

Abdomen bearing dense pubescence on ventral side; surface smooth, shining, finely punctured, without microreticulation.

Male: Metaventrite (Fig. 6) with a deep oval medial depression occupying slightly more than posterior half of metaventrite and three to four times longer than wide, widest at middle, with margins clearly edged; inner area of medial depression bearing long pubescence; metaventral area anterior of depression with long erected hairs.

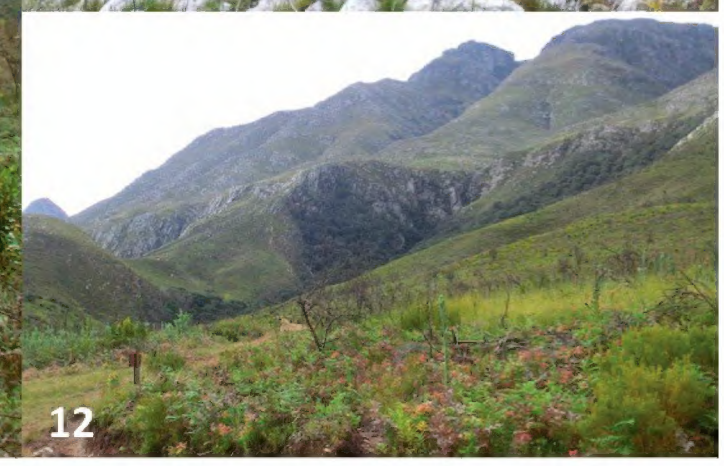
Sternite IX (Fig. 8) 0.51 mm long, formed by two tubular pieces joining anteriorly and linked by a thin membrane, strait on anterior 2/3, diverging in apical third, prolonged by quadratic membranous pieces with pubescent tips. Aedeagus (Fig. 9) 0.43 mm long; phallobase slightly sinuate around its midlength, 0.6 times as long as total aedeagal length; parameres straight, divergent posteriad, in basal half not distinct from median lobe; median lobe extremely thin, narrowed posteriad.

Female: Metaventrite (Fig. 7) with shallow lineiform groove directed longitudinally occupying 0.6 times of metaventral length, surrounded by strong hairs directed posteriad.

Discussion

The specimens of *Parvapila lyncispinnae* sp. nov. were collected by sifting floor litter in Afromontane forests (P. Hlaváč pers. comm.) and on the foot of big trees (P. Bulirsch pers. comm.) in a few localities of the Western Cape (Figs 10–12). Most of them are situated in the Grootvadersbosch and Marloth Nature Reserves at the foot of the Langeberg Range. This mountain chain, situated in Western Cape, is directed east-west and reaches an elevation of 1710 m a.s.l. It is mostly covered by fynbos, endemic shrublands of the Cape region, while patches of Afromontane forests grow in deep gorges (McDonald 1993). Additionally, a single individual of *P. lyncispinnae* was collected at the foot of the Kogelberg, a mountain chain culminating at almost 1300 m a.s.l.

The Afromontane region is an archipelago-like endemism centre distributed on reliefs of tropical Africa (White 1983). Three quarters of its flora is endemic (ca. 3000 spp.), and it shares a restricted number of plant species with the forests of lower elevation (White 1978). Afromontane vegetation shows a disjunct distribution, mostly occurring at high elevations (only above 2000 m a.s.l. in the tropics) (White 1983). However, in South Africa the effect of latitude compensate the elevation,



Figures 10–12. Habitat of *P. lyncispinnae* sp. nov. Specimens were collected in the patches of Afromontane forests. **10.** Duweilsbos; **11.** Platbos; **12.** Koloniesbos. Pictures: Jiří Janák.

making it possible for enclaves of Afromontane forests to grow at low elevations (down to ca. 100 m a.s.l.). They are mostly found on southern slopes, in moist or cloudy conditions, and with water-retaining soils (White 1978).

Parvapila lyncispinnae may be endemic to both South Africa and specifically to Afromontane forests. It is probable that more species of *Parvapila* and of other Orchesiini are still to be discovered in moist areas of Afrotropical regions, of which the knowledge concerning Melandryidae is extremely limited.

The apparent restricted distribution of *Parvapila* may indicate a Gondwanian origin. In this case, its closest relative may be *Lyperocharis*, from New Zealand and the Chilean subgenera of *Lederia*, *Fuscatelia* Nikitsky & Belov, 1982 and *Macrolederia* Nikitsky & Belov, 1982, all of them being apterous. However, the residual scutellar shield may suggest a more recent loss of the flight ability. Possibly, *Parvapila* is more closely related to *Hylobia* from New Zealand. The subdivision of Orchesiini into genera is based on the patterns of the metasternal sutures, the direction of the metacoxae, and the presence or absence of scutellum, and of wings. These characters do not necessarily reflect evolutionary relationships. Phylogenetic studies and taxonomic revisions are needed to better understand the relationships of the Orchesiini genera, and more generally, the systematics of Melandryidae. Synthetic works and identification tools are also needed.

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